

CAR AGA 4



# CAR AGA 4 WATER AERODROMES



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## FOREWORD

1. The Civil Aviation Authority Bahamas is referred to in these regulations as the “Authority”.
2. CAR AGA 4 contains regulations that prescribe the licensing and operational requirements of water aerodromes operating within the territory of The Bahamas. This regulation is issued pursuant to section 17 of the Civil Aviation Authority Act, 2021.

*Note:*

- a) All aerodromes, regardless of use, must be registered.*
- b) Land Based Aerodromes, capable of being certified, are addressed in CAR AGA 1.*
- c) Heliports, capable of being certified or licensed, are addressed in CAR AGA 2.*

*Land Based Aerodromes, either temporarily or permanently incapable of certification, may be licensed under CAR AGA 3*



Unless otherwise stated, applicable CAR DEF definitions and abbreviations are used throughout this document.

The editing practices used in this document are as follows:

‘Shall’ or ‘Will’ or ‘Must’ is used to indicate a mandatory requirement.

‘Should’ is used to indicate a recommendation.

‘May’ is used to indicate discretion by the Authority, the industry or the applicant, as appropriate.

*Note: The use of the male gender implies all genders.*

Paragraphs and sub-paragraphs with new, amended and corrected text will be enclosed within square brackets until a subsequent “amendment” is issued.

Manuals related to the specifications of CAR AGA 4;

- (a) Aerodrome Design Manual (Doc 9157)
- (b) Aeronautical Information Services Manual (Doc 8126)
- (c) Airport Planning Manual (Doc 9184)
- (d) Airport Services Manual (Doc 9137)
- (e) Air Traffic Services Planning Manual (Doc 9426)
- (f) Airworthiness Manual (Doc 9760)
- (g) Guidance on the Balanced Approach to Aircraft Noise Management (Doc 9829)
- (h) Human Factors Training Manual (Doc 9683)
- (i) Manual of Surface Movement Guidance and Control Systems (SMGCS) (Doc 9476)
- (j) Advanced Surface Movement Guidance and Control Systems (A-SMGCS) Manual (Doc 9830)
- (k) Manual on Certification of Aerodromes (Doc 9774)
- (l) Manual on Laser Emitters and Flight Safety (Doc 9815)
- (m) Manual on Simultaneous Operations on Parallel or Near-Parallel Instrument Runways (SOIR) (Doc 9643)
- (m) Manual on the ICAO Bird Strike Information System (IBIS) (Doc 9332)
- (n) Procedures for Air Navigation Services — Aircraft Operations (PANS-OPS) (Doc 8168)
- (o) Procedures for Air Navigation Services — Air Traffic Management (PANS-ATM) (Doc 4444)
- (p) Procedures for Air Navigation Services — Aerodromes (PANS-AERODROMES) (Doc 9981)
- (q) Safety Management Manual (SMM) (Doc 9859)
- (r) STOLport Manual (Doc 9150)
- (s) World Geodetic System — 1984 (WGS-84) Manual (Doc 9674)



**REVISION RECORD**

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## CHAPTER 1

### GENERAL

#### 1.1 Definitions

1.1.1 When the following terms are used in this regulation, they have the following meanings, otherwise applicable CAR DEF definitions and abbreviations are used throughout this document:

‘Seaplane’ – A fixed winged aeroplane which is designed for taking off and landing on water and includes amphibians operating as sea planes

‘License Holder’ – The authorized operator of the water aerodrome

‘Aeroplane’ – A power-driven heavier than air aircraft deriving its lift in flight chiefly from aerodynamic reactions on surfaces which remain fixed under given conditions of flight

‘Authorized Person’ – A credentialed individual who has been authorized to act on behalf of the Civil Aviation Authority Bahamas.

‘Fixed Platform’ – A platform extending from the shore, on water and supported by pillars to hold it in position, intended to align alongside seaplanes for the purposes of embarkation and disembarkation passengers, cargo, fuelling or parking

‘Floating Platform’ – A platform placed on open water authorized for the purpose of embarkation and disembarkation of passengers or cargo by seaplane

‘Water Aerodrome’ – A defined area, primarily on water, intended to be used either wholly or in part for the arrival, departure and movement of aircraft, and any building and equipment on ground or water

‘Water Runway’ – A defined rectangular area on a water aerodrome, intended for the landing and take-off of aircraft along its length

‘Movement Area’ – The part of an aerodrome to be used for take-off, landing and taxiing of aircraft, consisting of the manoeuvring area and platforms

‘Manoeuvring Area’ – The part of an aerodrome to be used for take-off, landing and taxiing of aircraft, excluding the platform.



## **CAR AGA 4**

## **CHAPTER 1**

### **1.2 Applicability**

- 1.2.1 CAR AGA 4 applies to all water aerodromes and splash down sites operating within the territory of The Bahamas.
- 1.2.2 Unless approved by the Authority licensed water aerodromes shall;
  - (a) not be used at night; and
  - (b) be used for VFR operations only.
- 1.2.3 CAR AGA 4 also applies to the aerodrome service providers, rescue and firefighting services, security agencies, technical support companies for aircraft: dispatch, online service, fuelling, food and beverage supply, handling of cargo operation and other organisations which perform or may perform independent activities at the water aerodrome.

### **1.3 Prohibitions**

- 1.3.1 A person shall not operate a water aerodrome unless it is licensed under these regulations.
- 1.3.2 A person shall not operate an aeroplane to or from any water aerodrome unless it is licensed under these regulations.
- 1.3.3 A person shall not conduct a splash down at any location in the territory of the Bahamas without the written permission of the Authority.
- 1.3.4 Aerodromes shall not be designated as a point of entry in the AIP or operate as a port of entry unless designated as a point of entry by the Authority.

### **1.4 Standards for Water Aerodromes**

- 1.4.1 The Director General may, , publish a Civil Aviation Publication (CAP) – Water Aerodromes, containing such standards, recommended practices and guidance material on water aerodromes
- 1.4.2 Any reference in these regulations to water aerodrome standards and practices is a reference to the standards and practices for water aerodromes that are set out in this document's Section 2 – Advisory Circulars as amended from time to time.
- 1.4.3 A water aerodrome operator shall comply with the standards, recommended practices and procedures that are required by the Advisory Circulars in Section 2, as appropriate to the operations conducted at the aerodrome and the requirements for aircraft using the aerodrome.



## 1.5 Requirements for Registration of an Aerodrome

All locations within the Bahamas used for the take-off and landing of aircraft shall be registered with the Authority. The aerodrome operator shall formally notify the Authority and provide the following minimum registration requirements:

- (a) The name of the aerodrome.
- (b) The location of the aerodrome including the geographical coordinates of the aerodrome
- (c) The owner and operator of the aerodrome
- (d) The types of aircraft operating
- (e) A description of the main activities carried out at the aerodrome.

## 1.6 Aerodrome Operator Responsibilities

The following aerodrome operator responsibilities shall be applicable to all aerodromes that conduct commercial passenger, cargo and mail operations within the Bahamas:

- (a) Movement area maintenance programs and plan for paved areas, unpaved areas, visual aids, electrical systems (as applicable), secondary power supply (as applicable.);
- (b) aeronautical studies and risk assessment;
- (c) safety audits and inspections by the Authority;
- (d) splash down site management and safety;
- (e) handling and storage of hazardous materials;
- (f) vehicle operations (as applicable);
- (g) obstacle control;
- (h) fencing; the boundary of the facility (specify what and where the fencing are required)
- (i) notifying and reporting aerodrome conditions to the pilots;
- (j) safety during construction or maintenance;
- (k) ground servicing of aircraft;
- (l) disabled aircraft removal;



- (m) land use and environmental management;
- (n) aerodrome incident reporting and investigation; and
- (o) any other provision that in the opinion of the Authority is applicable to the aerodrome, commensurate with the aerodrome operations.

## 1.7 Abbreviations

1.7.1 In this regulation, the terms and expressions listed below have the following meaning:

(a) Abbreviations

AC	Advisory Circulars
AIC	Aeronautical Information Circulars
AIP	Aeronautical Information Publication
AIS	Aeronautical Information Services
WAOM	Water Aerodrome Operations Manual
APRX	Approximately
ASDA	Accelerate-stop distance available
ARIWS	Autonomous runway incursion warning system
ATS	Air traffic services
AVSEC	Aviation Security
C	Degree Celsius
CBR	California bearing ratio
cd	Candela
cm	Centimetre
DME	Distance measuring equipment
Ft	Foot
ILS	Instrument landing system
IMC	Instrument meteorological conditions
K	Degree Kelvin
kg	Kilogram
km	Kilometre
km/h	Kilometre per hour
kt	Knot
L	Litre
LDA	Landing distance available
m	Metre
max	Maximum
min	Minimum
mm	Millimetre
MN	Meganewton
MPa	Megapascal



MTOM	Maximum Take-off Mass
NM	Nautical mile
NU	Not usable
OCA/H	Obstacle clearance altitude/height
OFZ	Obstacle free zone
OLS	Obstacle Limitation Surfaces
OMGWS	Outer main gear wheel span
OPS	Obstacle protection surface
PANS	Procedures of Air navigation service
PCN	Pavement classification number
RCAM	Runway Condition Assessment Matrix
RCR	Runway condition report
RESA	Runway end safety area
RVR	Runway visual range
RWYCC	Runway condition code
TODA	Take-off distance available
TORA	Take-off runway available
TRA	Task Resource Analysis
VMC	Visual meteorological conditions
VOR	Very high frequency omnidirectional radio range

(b) Symbols

°	-	Degree
=	-	Equals
'	-	Minute of arc
μ	-	Friction coefficient
>	-	Greater than
<	-	Less than
%	-	Percentage
±	-	Plus or minus

## 1.8 Operational Coordination with Service Providers

The aerodrome operator shall coordinate with Air Traffic Services, Meteorological Services, Aeronautical Information Services, Rescue and Firefighting Services, Aviation Security Agencies, Customs, Immigration and all other relevant services to ensure safety, availability and continuity on the provision of such services.

- 1.8.2 In addition to aviation legislation, a seaplane in contact with the water is subject to maritime legislation; including the International Regulations for the Prevention of Collision at sea and local bylaws that are not addressed in this document. Where appropriate, the aerodrome operator should consult with those bodies that have a regulatory or statutory interest in the use of, or in the operation of, a water aerodrome.



- 1.8.3 All Service Providers shall actively adhere to the aerodrome Safety Management System (SMS).
- 1.8.4 The aerodrome operator shall chair and lead as a minimum, the following committees:
- (a) The Safety Management Committee.
  - (b) The Security and Facilitation Committee.
  - (c) The Runway Safety Team
  - (d) The Emergency Planning Committee,
  - (e) The Wildlife Hazard Control Committee
- 1.8.5 The aerodrome operator shall implement Service Level Agreements with the aerodrome users and service providers with the aim of agreeing competences, liabilities or any other aspects needed to ensure aerodrome safety, availability, and continuity of service provision.
- 1.8.6 The aerodrome operator shall make arrangements with the aeronautical information services provider for immediate notification to ensure that the appropriate parties receive the necessary data to provide updated information prior to the flight and satisfy the need of information during the flight, including;
- (a) information on the aerodrome licensing situation and the aerodrome conditions;
  - (b) serviceability of the facilities, services and navigation aids located within the area of competence;
  - (c) any information that may be relevant to operations.
- 1.8.7 To ensure that aeronautical information services units obtain information to enable them to provide up-to-date pre-flight information and to meet the need for in-flight information, arrangements shall be made between aeronautical information services and aerodrome authorities responsible for aerodrome services to report the following to the responsible aeronautical information services unit, with a minimum of delay.
- (a) Information on the status of certification of aerodromes and aerodrome conditions.
  - (b) the operational status of associated facilities, services, and navigation aids within their area of responsibility;
  - (c) any other information considered to be of operational significance.



- 1.8.9 Before introducing changes to the air navigation system, due account shall be taken by the services responsible for such changes of the time needed by aeronautical information services for the preparation, production, and issue of relevant material for promulgation.

*Note: To ensure timely provision of the information to aeronautical information services, close coordination between those services concerned is required. Of a particular importance are changes to aeronautical information that affect charts and/or computer-based navigation systems which qualify to be notified by the aeronautical information regulation and control (AIRAC) system, as specified in CAR AIS, (Regulation and Control of Aeronautical Information)*

- 1.8.10 The predetermined, internationally agreed AIRAC effective dates in addition to 14 days postage time shall be observed by the responsible aerodrome services when submitting the raw information/data to aeronautical information services.
- 1.8.11 The aerodrome services responsible for the provision of raw aeronautical information/data to the aeronautical information services shall ensure accuracy and integrity requirements for aeronautical data as specified in CAR AIS.

## 1.9 Access to the Aerodrome and Inspections

- 1.9.1 The Authority may verify, audit, inspect and carry out tests on the aerodrome facilities, services and equipment, inspect the aerodrome operator's documents and records and audit the aerodrome operator's SMS before the aerodrome licence is granted or renewed and subsequently, at any other time, for the purpose of ensuring safety at the aerodrome.
- 1.9.2 An aerodrome operator or applicant shall, at the request of the Authority's ~~authorised person~~ cooperate during inspections and allow access to any part of the aerodrome or any aerodrome facility, including equipment, technical records and documents as well as operator and management personnel.
- 1.9.3 The aerodrome operator shall observe and comply with the annual monitoring programme established by the Authority for safety monitoring purposes at each aerodrome. This shall not affect random unannounced inspections or audits conducted by the Authority to determine whether approved operation requirements and procedures are met under all circumstances and whether they comply with CAR AGA 4.
- 1.9.4 The aerodrome operator shall resolve the findings from the Authority and once notified by an official report, shall send a corrective action plan within the established period for resolving the finding.
- 1.9.5 Failure to resolve the findings may result in the revocation/suspension of the aerodrome licence and/or enforcement consequences.





## **1.10 Deviations**

- 1.10.1 An aeronautical study shall be conducted to assess the impact of deviations from the aerodrome standards specified in these regulations, to present alternative means of ensuring the safety of aircraft operations, to estimate the effectiveness of each alternative and to recommend procedures to compensate for the deviation.
- 1.10.2 The operator of a water aerodrome shall inform the Authority in writing, of the deviation within 5 days after the deviation was made. Verify

## **1.11 Operational Directives**

- 1.11.1 The Authority may issue operational directives to prohibit, limit or subject an operation to certain conditions in the interest of safety.
- 1.11.2 Operational directives shall include:
- (a) The reason for issuance;
  - (b) The scope and duration; and
  - (c) Action required from aerodrome operators.
- 1.11.3 Anything required by the operational directives shall be considered an additional requirement to those established in CAR AGA 4.

## **1.12 Airport design**

- 1.12.1 Architectural and infrastructure-related requirements for the optimum implementation of international civil aviation security measures shall be integrated into the design and construction of new facilities and alterations to existing facilities at a water aerodrome.
- 1.11.2 The design of water aerodromes shall take into account land-use, water-use and environmental control measures.

## **1.13 Aerodrome reference code**

- 1.13.1 An aerodrome reference code, code number and letter which are selected for aerodrome planning purposes shall be determined in accordance with the characteristics of the aeroplanes for which an aerodrome facility is intended.
- 1.13.2 The aerodrome reference code numbers and letters shall have the meanings assigned to them and corresponding code numbers determined from Table 1-1 of CAR AGA 1.



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**CHAPTER 2****LICENSING PROCESS****2.1 General requirements for approval**

2.1.1 An aerodrome operator shall apply to the Authority at least 120 days prior to proposed commencement of aircraft operations.

2.1.2 The aerodrome operator must satisfy the Authority that;

- (a) its organisation and management are suitable and properly matched to the (complexity of the operation) scale and scope of the operation; and
- (b) procedures for the supervision of operations have been defined.

2.1.3 An aerodrome operator shall not provide any aerodrome related service otherwise than under, and in accordance with, the terms and conditions of an aerodrome licence from the Authority.

2.1.4 An applicant for an aerodrome licence, or variation of an aerodrome licence, shall allow the Authority to examine all safety aspects of the proposed service.

2.1.5 An applicant for a water aerodrome licence, or revalidation of the aerodrome licence; shall:

- (a) Have his principal place of business and, if any, his registered office located in The Bahamas;
- (b) satisfy the Authority that he is able to conduct the operation in a safe manner.

2.1.8 An applicant for a water aerodrome licence shall establish a safety management system, which is;

- (a) in accordance with the framework elements contained in CAR SMS;
- (b) commensurate with the size of the service provided and the complexity of its aviation products or services; and
- (c) acceptable to the Authority as the State responsible for the aerodrome's licensing.

**2.2 Grant of a Water Aerodrome licence**

2.2.1 The Authority shall issue an applicant a water aerodrome licence provided:

- (a) The applicant has satisfactorily completed the technical licensing process;



- (b) The applicant and his staff have demonstrated the necessary competence and experience to operate and maintain the aerodrome safely;
- (c) The water aerodrome operating manual submitted by the applicant for approval contains all the relevant information corresponding to the aerodrome site, facilities, services, equipment, operating procedures, organisation and management as stated in this regulation;
- (d) The aerodrome facilities, services and equipment are in accordance with this regulation;
- (e) The aerodrome operating procedures make satisfactory provision for the safety of aircraft; and
- (f) The applicant has implemented an acceptable SMS.

2.2.2 Any conditions or limitations stated on the aerodrome licence shall be complied with.

### **2.3 Duration of a Water Aerodrome licence**

2.3.1 A water aerodrome licence issued under this regulation shall remain in force from the date of issue until it is suspended, or cancelled by the Authority or, alternatively, until the validity period has expired.

2.3.2 A water aerodrome licence shall be valid for a maximum period of 1 year

2.3.3 Any renewals of the aerodrome licence shall be subject to approval by the Authority.

2.3.4 The Authority may revoke a water aerodrome licence if during the surveillance process the aerodrome operator does not demonstrate that it maintains the necessary competencies or if it incurs in recurring failures in the resolution of any non-conformities found.

### **2.4 Transfer of a Water Aerodrome licence**

2.4.1 The Authority may give its consent to and issue an instrument of transfer of an aerodrome licence to a transferee when:

- (a) The current holder of the aerodrome licence notifies the Authority, in writing, at least three months before ceasing to operate the aerodrome, of his intention to transfer the licence of the aerodrome, including the name of the transferee or aerodrome operator.
- (b) The transferee applies to the Authority, in writing, within three months before the current holder of the aerodrome licence ceases to operate the aerodrome for the aerodrome licence to be transferred to the transferee.



2.4.2 If there are no changes in the original terms of the licence, only the holder transfer shall be recorded and the licence amended. If there are changes, the Authority shall evaluate the situation and communicate, in writing, to the transferee the actions to be taken. These actions may go from a partial re-licensing process or less, up to the application of the full licensing process.

2.4.3 If the Authority does not consent to the transfer of an aerodrome licence, it shall notify the transferee, in writing, of its reasons no later than 15 business days after making that decision.

## **2.5 Amendment of a Water Aerodrome licence**

2.5.1 The Authority may amend a water aerodrome licence when:

- (a) there is a change in the ownership;
- (b) there is a change in the use;
- (c) there is a change in the boundaries of the aerodrome; or
- (d) the holder of the aerodrome licence requests an amendment by requirement of the Authority.

## **2.6 Surrender of a Water Aerodrome licence**

2.6.1 An aerodrome licence holder must give the Authority not less than 60 days' written notice of the date on which the licence is to be surrendered in order that suitable promulgation action can be taken.

2.6.2 The Authority shall cancel the aerodrome licence after the notice period is closed.

## **2.7 Interim Water Aerodrome Certificate**

2.7.1 The Authority may grant an interim water aerodrome certificate to an applicant if the Authority is satisfied that:

- (a) a water aerodrome certificate in respect of the aerodrome will be issued to the applicant or transferred to the transferee as soon as the application procedure for the grant or transfer of a certificate has been completed; and
- (b) the grant of the interim certificate is in the public interest and is not detrimental to aviation safety.

2.7.2 An interim water aerodrome certificate shall expire on:

- (a) the date on which the water aerodrome certificate is issued or transferred; or
- (b) the expiry date specified on the interim water aerodrome certificate; whichever is earlier.



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**CHAPTER 3****WATER AERODROME OPERATIONS MANUAL****3.1 Requirement of the Water Aerodrome Operations Manual**

3.1.1 To be a holder of a water aerodrome licence, the applicant shall have a water aerodrome operations manual approved by the Authority, containing relevant information for the aerodrome maintenance and operation in accordance with its policies and procedures. This manual is called the Water Aerodrome Operations Manual – WAOM.

3.1.2 An amendment to the WAOM shall be approved by the Authority prior to becoming effective.

**3.2 Preparation of the Water Aerodrome Operations Manual (WAOM)**

3.2.1 The aerodrome operations manual shall:

- (a) Be typewritten and printed in English;
- (b) Be in a format that is easy to revise and use;
- (c) Have a system for logging revisions;
- (d) Have the initial approval date and the list of effective pages duly signed to support the revision approvals.
- (e) Have a guarantee from the aerodrome operator, that the WAOM and its revisions do not infringe any standards of this regulation.
- (f) Include all revisions and amendments required by the Authority, aimed at ensuring aircraft safety.
- (g) Be organised in a manner that will facilitate the preparation, review and acceptance/approval process by the Authority. It may be structured in one or multiple volumes, whichever is more convenient.
- (h) Some regulatory requirements, such as;
- (i) SMS Manual;
- (j) Aerodrome Emergency Plan;
- (k) Rescue and Firefighting Manual,
- (l) Training Manual;



- (m) Preventive and Corrective Maintenance Plan; or
- (n) Wildlife Hazard Management Plan may be submitted separately but shall be referenced within the AOM and form part of the WAOM.
- (o) The WAOM shall comprise all policies and procedures including information and instructions necessary for the Accountable Manager to carry out their duties and shall comply with the provision contained in Section 2 – Advisory Circulars.

### **3.3 Contents of the Aerodrome Operations Manual**

- 3.3.1 The WAOM required by this CAR shall contain all the relevant information concerning the aerodrome site, services, operating procedures, equipment, facilities, organisation and management including the SMS.
- 3.3.2 If a requirement is not included in the WAOM because it is not applicable to the aerodrome, the reason shall be indicated in the manual.

*Note: Refer to Section 2 – Advisory Circulars for guidance on the content of the WAOM.*

### **3.4 Amendment and Location of the Water Aerodrome Operations Manual**

- 3.4.1 An aerodrome operator shall:
  - (a) Ensure that the WAOM is amended so that its instructions and information are current.
  - (b) Ensure that the administrative personnel, as well as the Operations, Maintenance and SMS personnel and any person or entity responsible for a manual, receive the approved revisions in a timely manner.
  - (c) Keep at least one complete and current copy of the WAOM at each Operations, Maintenance and SMS Department.
  - (d) Provide the applicable parts or portions of the WAOM, or a complete copy, to the aerodrome personnel in charge of its implementation.
  - (e) Keep master control of all existing manuals.
  - (f) Ensure any holder of the WAOM, or any of its parts, is responsible for keeping this document up to date with the amendments provided by the aerodrome operator.

### **3.5 Water Aerodrome Operations Manual Review**

- 3.5.1 The Authority may review the WAOM:





- (a) At the aerodrome operator's request, who may require to include modifications to the conditions initially approved, related to the aerodrome site, services, operating procedures, equipment, facilities, organisation, aerodrome management or the SMS, or
- (b) If a revision is determined to be needed in the interest of safety.

3.5.2 A WAOM revision request shall be submitted at least 30 business days prior to the date set for entry into force, unless the Authority approves a shorter period upon request of the applicant.

3.5.3 In case of revisions originated by the Authority, the aerodrome operator shall be notified of the reasons for revision and the pages with the proposed revisions shall be included. The aerodrome operator has 7 business days to submit in writing his/her viewpoints and arguments on the revision. After evaluating the information, the Authority shall decide whether or not to adopt the revision. The revision shall be effective 30 business days after the aerodrome operator receives it.

3.5.4 If the Authority determines the presence of an emergency condition requiring immediate safety action that prevents the implementation of the procedures provided in paragraph 3.5.3, a revision shall be carried out and it shall be effective since the aerodrome operator receives it. The Authority shall briefly describe the emergency in the letter of formal amendment notice. Once the emergency is solved, the aerodrome operator may request the Authority a reevaluation of the elements causing the emergency and the revision required.

### **3.6 Approval of the Water Aerodrome Operations Manual**

3.6.1 For the purposes of WAOM approval, or the volumes comprising it, the aerodrome operator shall submit two copies to the Authority.

3.6.2 The Authority shall approve the WAOM or the volumes comprising it, and any revision provided that CAR requirements are met.

3.6.3 Once the WAOM, or the volumes comprising it, are approved, the Authority shall return a copy to the aerodrome operator and keep a copy of each one in the aerodrome licensing file.

**CHAPTER 4****PHYSICAL CHARACTERISTICS****4.1 General Operating Conditions**

- 4.1.1 The water aerodrome operator shall take all reasonable measures to ensure that obstacles at, or within the vicinity of the aerodrome are detected and reported to the Authority as quickly as possible.
- 4.1.2 No person shall operate any device on any water aerodrome to which these regulations apply which may cause interference to communication between aircraft and ground.
- 4.1.3 During operational hours, the water aerodrome operator shall ensure that the movement area is free of hazards.
- 4.1.4 The water aerodrome operator may take all reasonable actions to remove any object or vessel anchored, moored or otherwise within any water aerodrome in contravention of this regulation.
- 4.1.5 The water aerodrome operator is responsible for ensuring that no unauthorized person shall enter or remain in a water aerodrome to which these regulations apply to promote the safety of all aircraft and their passengers, cargo and crew during operational hours.
- 4.1.6 Information relating to the licensed water aerodromes shall be published by the Authority in the Aeronautical Information Publication.

**4.2 Care and Diligence in Operation and Maintenance**

- 4.2.1 The operator of a licensed water aerodrome shall ensure that the aerodrome is operated and maintained with a reasonable degree of care and diligence water aerodrome operator shall implement a maintenance program at the aerodrome. Such a maintenance program shall comply with the requirements specified in Section 2 – Advisory Circulars and shall include preventive maintenance work as well as routine inspections and corrective maintenance work.

**4.3 Aerodrome Condition Notification**

- 4.3.1 The operator of a certified water aerodrome shall notify the Aeronautical Information Service (AIS), as soon as practicable, for the purpose of issuance of a Notice to Airmen (NOTAM), of any aerodrome operational condition or defect at the aerodrome that may affect the safe operation of aircraft.



4.3.2 Each holder of a water aerodrome operating certificate shall establish procedures for restricting aircraft operations where an unsafe condition exists on an aerodrome.

4.3.4 The procedures shall ensure that operations are not conducted on portions of the aerodrome where such an unsafe condition exists.

#### **4.4 Notice of Changes in Physical Condition of Aerodrome**

4.4.1 The operator of a licenced water aerodrome shall, in accordance with the aerodrome standards, give notice to the Authority of:

- (a) any temporary or permanent change in the physical condition of the aerodrome that may affect the safety of aircraft; and
- (b) any other occurrence relating to the operation or maintenance of the aerodrome that may affect the safety of aircraft.

4.4.2 If the water aerodrome is a controlled aerodrome, the notice shall also be given to air traffic control.

#### **4.5 Notice of Changes in Information Published in the AIP**

4.5.1 To maintain accuracy of the information published in Aeronautical Information Publications (AIP) relating to the physical characteristics of a licensed water aerodrome, the operator of the aerodrome shall inform the Authority, in writing, as soon as practicable of any change required to that information.

4.5.2 The operator of a water aerodrome shall inform the Authority in writing, of the required change within 5 days after the action which precipitated the need to change the information in the AIP occurred.

#### **4.6 Physical Characteristics of Movement Area**

4.6.1 The operator of a licensed water aerodrome shall ensure that the physical characteristics of the movement area comply with the standards set out in Section 2 – Advisory Circulars.

#### **4.7 Aerodrome Markers**

4.7.1 The operator of a licenced water aerodrome, where practicable, shall mark the following areas of the aerodrome in accordance with the standards set out in CAP- Water Aerodromes:

- (a) the movement area;
- (b) any unserviceable area;
- (c) any obstacle; and



(d) any works area on or near the movement area.

4.7.2 The operator shall ensure that all aerodrome markings are maintained in accordance with the standards set out in Section 2 – Advisory Circulars.

#### **4.8 Wind Direction Indicators**

4.8.1 The operator of a licenced aerodrome shall, in accordance with the standards for wind direction indicators set out in Section 2 – Advisory Circulars, install, where practicable, and maintain at least one wind direction indicator at the aerodrome.

**CHAPTER 5****WATER AERODROME EMERGENCY PLANNING****5.1 Aerodrome Emergency Plan**

5.1.1 The operator of a licenced Water Aerodrome shall prepare an aerodrome emergency plan.

5.1.2 The plan shall include:

- (a) activities commensurate with the aircraft operations and other activities conducted at the aerodrome;
- (b) procedures for coordinating the responses of all actions to be taken in the event of an emergency occurring on or in the vicinity of the aerodrome;
- (c) if the aerodrome is located in or near a difficult environment/terrain and a significant portion of approach or departure operations takes place over these areas, coordination with readily available appropriate specialist rescue services; and
- (d) human factor principles to ensure optimum response by all agencies participating in the emergency situations.

**5.2 Aerodrome Emergency Committee**

5.2.1 The operator of a certified water aerodrome shall establish an aerodrome emergency committee as defined in Section 2 – Advisory Circulars.



## CHAPTER 6

## SAFETY MANAGEMENT SYSTEM

**6.1 Safety Management System**

6.1.1 The operator of a licensed water aerodrome shall ensure that the aerodrome has an acceptable Safety Management System (SMS) that shall:

- (a) be established in accordance with the framework elements contained in ICAO Annex 19;
- (b) be in compliance with CAR SMS; and
- (c) be commensurate with the size of the aerodrome operator and the complexity of the aerodrome.

*Note: The water aerodrome operator may apply a common SMS policy to all water aerodromes under its control, subject to acceptance by the Authority.*



**CHAPTER 7**

**RESCUE AND FIRE FIGHTING**

**7.1 Aerodrome Rescue and Firefighting Services**

7.1.1 Rescue and firefighting equipment and services shall be provided at an aerodrome as directed by the Authority , and where so directed shall be in accordance with the specifications provided in the Section 2 – Advisory Circulars.



**CHAPTER 8**

**OBSTACLE LIMITATION SURFACES**

**8.1 Obstacle Limitation Surfaces (OLS)**

8.1.1 Obstacles limitation Surfaces of the Water Aerodrome shall be established as per the requirements of Section 2 – Advisory Circulars.



**CHAPTER 9****WILDLIFE HAZARD MANAGEMENT****9.1 Wildlife Hazard Management**

- 9.1.1 The operator of a licenced water aerodrome shall provide a Wildlife hazard management plan that includes the identification of the risk and hazards that may exist, and suitable mitigation measures as contained in Section 2 – Advisory Circulars.
- 9.1.2 All reasonable measures shall be taken to discourage Wildlife from gathering in the movement area, and under anticipated departure and arrival flight paths.

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The Director General, in exercise of the powers conferred by Section 17(1) of the Civil Aviation Authority Bahamas Act, 2021 (No. 2 of 2021) hereby issues the foregoing amended regulation.

**Issued the 1st day of March 2023**

An electronic signature of Alexander B. Ferguson is shown in blue ink, written over a circular watermark of the CAAB logo. Below the signature, the text 'Electronic Signature' and 'Alexander B. Ferguson' is printed in a small font.

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**DIRECTOR GENERAL  
CIVIL AVIATION AUTHORITY BAHAMAS**



## SECTION 2

### ADVISORY CIRCULARS (AC)

#### INTRODUCTION

This Section 2 contains Advisory Circulars (AC), which is additional text related to the CAR requirements to clarify and provide guidance for its application. It contains explanations, interpretations and/or acceptable means of compliance.

ICAO Annex 14 does not differentiate between land and water as a surface from which aircraft can operate; and Annex 14 defines that an aerodrome can be an area of land or water.

Operations of aeroplanes on water differ significantly from those conducted on land, and the criteria used for Licencing of land aerodromes may not be appropriate for Licencing of water aerodromes. However, one fundamental Licencing criterion that requires the aerodrome Licence holder to establish and maintain an appropriate Safety Management System (SMS) remains the same for both land and water aerodromes.

Under the Civil Aviation Act 2021, the Civil Aviation Authority Bahamas (CAA-B) is the responsible authority for the aerodrome licensing process, continuous oversight and surveillance, and for promulgating appropriate and clear Aerodrome Standards to be complied with by Aerodrome Operators.

The specifications outlined in this document focus on those facilities, services, and equipment where water aerodromes differ from land aerodromes in terms of their design and operations and the requirements for their licensing.

*Note. – This guidance material outlines the minimum specifications for the physical characteristics, obstacle limitation surfaces (OLS), visual aids, services, and operating procedures to be provided at water aerodrome for seaplanes operating maximum mass of 5700Kg and below.*



## CHAPTER 1

### GENERAL

#### AC 1.1 OVERVIEW

This Advisory Circulars contains guidance for the licensing and operation of aerodromes. It provides the procedures that must be followed for showing compliance with the Water Aerodromes Regulations of CAR AGA 4 and guidance material to assist in showing compliance.

#### AC.1.2 APPLICABILITY

The material contained herein applies to applicants seeking approval to establish and operate water aerodromes as well as Aerodrome Operators intending to transfer, amend or surrender Aerodrome Licences or modify their aerodrome facilities.

#### AC 1.3 DEFINITIONS

**Aerodrome** – A defined area on land or water (including any buildings, installations, and equipment) intended to be used either wholly or in part for the arrival, departure and movement of aircraft.

**Aeroplane** – A power-driven heavier than air aircraft deriving its lift in flight chiefly from aerodynamic reactions on surfaces which remain fixed under given conditions of flight.

**Fixed platform** – A platform extending from the shore, on water and supported by pillars to hold it in position, intended to align alongside seaplanes for the purposes of embarkation and disembarkation of passengers, loading and unloading of cargo, or refuelling or parking of seaplanes.

**Floating platform** – A platform placed on open water authorized for the purpose of embarkation and disembarkation of passengers, loading and unloading of cargo by seaplane.

**Gangway** – A movable walkway where people board and disembark such as platforms, and piers.

**Low water level** – The average low level during that month of the year when levels are lowest or, in the case of tidal waters, the average level of low water springs or lower low waters, depending on the type of tide.

**Mooring** – A fixed permanent installation on the water surface used to secure seaplanes. The seaplane may be moored to a floating buoy, a pier, platforms, etc.

**Mooring buoy** – A buoy connected by chain or cable to a permanent unmovable anchor sunk deeply into the bottom of a body of water.

**Protected area** – An area which is protected from large waves. The structure providing protection can be natural or constructed.



**Seaplane** – An aeroplane on floats (amphibious or non-amphibious) or a flying boat (water-only or amphibious).

**Taxi channel** – A defined path on a water aerodrome, intended for the use of taxiing seaplanes.

**Turning basin** – A water area used for the water taxi manoeuvring of seaplanes along shoreline facilities and at the ends of a narrow water runway.

**Waterways** – A channel, canal or other waterbody serving as a route or way of travel or transport.

**Water aerodrome** – A defined area, primarily on water, intended to be used either wholly or in part for the arrival, departure and movement of seaplanes, and any building and equipment on ground or water.

**Water aerodrome movement area** – The part of an aerodrome to be used for take-off, landing and taxiing of seaplanes, consisting of the manoeuvring area and platforms.

**Water aerodrome operator** – Any organization/ or person in charge of a water aerodrome including employee, agent, or other authorized representative.

**Water current** – is rate of flow of the water.

**Water runway (channel)** – A defined rectangular area on a water aerodrome, intended for the landing and take-off of seaplane along its length.

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## CHAPTER 2

## WATER AERODROME DATA

*Note. — This Part contains specifications for the provision of data relating to the water aerodrome that is to be determined and recorded in the **Water Aerodrome Operations Manual (WAOM)**. This Part is also used to define the characteristics of water aerodrome that are to be made available through the aeronautical information publications and/or disseminated through an aeronautical information service.*

**AC 2.1      ROLE/STATUS OF THE WATER AERODROME MANUAL IN THE LICENSING PROCESS**

- 2.1.1 The WAOM is a fundamental requirement of the licensing process. It shall contain all the relevant information about the aerodrome for processing the application before granting an Aerodrome Licence.
- 2.1.2 The information presented in the WAOM shall demonstrate that the aerodrome conforms to the Licensing standards and safety directives put forth by the CAA-B, and that there are no apparent shortcomings which would adversely affect the safety of aircraft operations.
- 2.1.3 The WAOM shall be a reference document and provides a checklist of aerodrome licensing standards to be maintained and the level of airside services at the aerodrome.
- 2.1.4 Information provided in the WAOM will be the basis to assess the suitability of the aerodrome for the aircraft operations proposed and to judge an applicant's capability to be eligible to be granted a Licence. It is a basic reference guide for conducting site inspections for granting an Aerodrome Licence and for subsequent continued surveillance/safety inspections.
- 2.1.5 The WAOM is a reference document agreed to between the Aerodrome Operator and the CAA-B with respect to the standards, conditions and the level of service to be maintained at the aerodrome.
- 2.1.6 The WAOM shall contain all the relevant information to describe the management and operational structure of the aerodrome. It is the means by which all aerodrome operating staff are fully informed as to their duties and responsibilities with regard to safety, including information and instructions related to those matters specified in the applicable regulation. It describes the aerodrome services and facilities, all operating procedures, and any restrictions in place.

**AC 2.2      WATER AERODROME DATA QUALITY REQUIREMENTS**

- 2.2.1 Except as specified, the determination and reporting of water aerodrome-related aeronautical data shall be in accordance with the accuracy requirements set forth below taking into account the established quality system procedures:
  - (a) The water aerodrome elevation shall be measured to the accuracy and rounded up to the next higher of one-half metre or foot;
  - (b) Linear dimensions shall be measured to the nearest one-half metre;
  - (c) Aeronautical geographical co-ordinates (indicating latitude and longitude) shall be expressed in terms of the WGS-84 reference datum;



- (d) True bearings shall be measured to the nearest degree;
- (e) Water depths shall be measured and rounded down to the nearest one tenth of metre; and
- (f) Tides shall be measured with respect to lowest tides recorded for the location.

### **AC 2.3 GEOGRAPHIC DATA**

#### **Geometric centre**

- 2.3.1 The geometric centre of a water aerodrome shall be determined and given to the nearest 1/10<sup>th</sup> second.

#### **Water aerodrome elevation**

- 2.3.2 Average highest elevation of the water runway shall be measured with reference to mean sea level.

#### **Water aerodrome magnetic variation**

- 2.3.3 The magnetic variation for the water aerodrome geometric centre shall be determined and given to the nearest degree from magnetic north.

#### **Navigation aids**

- 2.3.4 Where navigation aids are installed for use at water aerodromes, the following information shall be determined and given:
- (a) the bearing, geographic co-ordinates of the antenna or radiating centre to the nearest 1/10<sup>th</sup> second; and
  - (b) the elevation of the antenna or radiating centre.

### **AC 2.4 WATER AERODROME DIMENSIONS AND RELATED INFORMATION**

- 2.4.1 The following data shall be measured or described and given for each facility provided on a water aerodrome:
- (a) Water runway(s)
    - i. True bearing;
    - ii. Length;
    - iii. Width;
    - iv. Depth of water; and
    - v. Water current.
  - (b) Turning basins:
    - i. Location;
    - ii. Dimension; and
    - iii. Depth of water.
  - (c) Shore facility:
    - i. Type; and
    - ii. Depth at shore.



- (d) Significant obstacles on and in the vicinity of the water aerodrome:
  - i. Location;
  - ii. Top elevation to the nearest (next higher) foot; and
  - iii. Type
- (e) Markers:
  - i. Water runways;
  - ii. Taxi channels; and
  - iii. Hazardous areas.

## **AC 2.5 PROVISION OF OPERATIONAL INFORMATION**

### **Movement area and related facilities**

2.5.1 Information on the condition of the movement area and the operational status of related facilities shall be given to the appropriate aeronautical information service;

- (a) Information of operational significance shall be given to the appropriate air traffic services units; and
- (b) The information shall be kept up to date.

2.5.2 The condition of the movement area and the operational status of related facilities shall be monitored and reports of operational significance or affecting seaplane performance shall be given to the appropriate air traffic services units in respect of:

- (a) damage to shore facility;
- (b) floating debris in the movement area;
- (c) temporary hazards to include log booms, surface vessels or any other surface or below surface hazard;
- (d) abnormally high/low water depth;
- (e) water currents;
- (f) tidal areas, depth of water at high and low tides or seasonal changes; and
- (g) any other information that may have safety impact on operations.

2.5.3 Information on water runway(s) shall consist of:

- (a) the tidal range;
- (b) the times of high and low tide; and
- (c) the approximate speed and direction of the water current.

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## CHAPTER 3

### PROCESS OF AERODROME LICENSING

#### AC 3.1 THE PROCESS

The requirements for the licensing of water aerodromes in The Bahamas are contained within CAR AGA 4. The aerodrome licensing process has been subdivided into five distinct stages. Water Aerodromes must be in possession of an Aerodrome Licence before commencing operations.

Applicants wishing to design, construct and operate an aerodrome under CAR AGA 4 should note that the process for the construction of an aerodrome is an integral part of the aerodrome licensing process and would not terminate after the construction of the aerodrome. Such applicants are under obligation to complete the rest of the process before commencing operations.

Fundamentally, the aerodrome licensing process comprises the following five phases:

- (a) Phase 1 – Pre-Application

An expression of interest for an Aerodrome Licence by the intending applicant to the CAA-B;

- (b) Phase 2 – Formal Application

The applicant must formally apply to the CAA-B at least 120 days prior to planned operations. The CAA-B will assess the formal application;

- (c) Phase 3 – Document evaluation
- (d) Phase 4 – Assessment of aerodrome
- (e) Phase 5– Grant/Refusal of a Water Aerodrome Certificate / Licence

The CAA-B will issue or refuse the applicant the granting of a Water Aerodrome Certificate or Licence;

The Operator shall promulgate the licenced status of an aerodrome and the required details in the Aeronautical Information Publication.

#### AC 3.2 EXEMPTIONS

##### 3.2.1 General

- (a) An application for an exemption is a request from an Aerodrome Operator to deviate from the requirements of a regulation or part thereof. An application for an exemption to a provision of CAR AGA 3 may originate among others from Airport Operators for Aerodrome Licensing purposes.





- (b) The DAGA maintains a record of all exemptions issued by the CAA-B and ensures that deviation information is published in the AIP through coordination with Aeronautical Information Service.

### 3.2.2 Receipt of Application for an Exemption

- (a) CAR AGA 3 permits an Aerodrome Operator to apply to the CAA-B for a deviation. Any application for a deviation from any provision should be forwarded to the CAA-B for consideration. The application should contain the following:
  - (i) A compelling case to support why the proposed deviation should be granted.
  - (ii) The provision of any information and documentation to support the case that the exemption is:
    - (a) in the public interest; and
    - (b) not likely to affect aviation safety.
  - (iii) Propose conditions that would mitigate any risk that could be created by virtue of the deviation to ensure that aviation safety will not be affected.

## AC 3.3 POST LICENSING

### 3.3.1 Aerodrome Operator's Obligations

- (a) An aerodrome that is granted an Aerodrome Licence under the applicable regulations needs to keep the licence current and any change in the level of facilities, services and equipment needs to be brought to the attention of CAA-B without delay. Any necessary amendments to the Aerodrome Manual must be carried out in consultation with the CAA-B with a final copy being registered with the CAA-B as required by CAR AGA 3.
- (b) To meet the above obligations, the Aerodrome Operator is required to have a continuous compliance monitoring process which shall include (internal/self) audits and inspections of the aerodrome facilities, services and equipment as well as of the Aerodrome Safety Management System, including the Aerodrome Operator's own functions. The Aerodrome Operator shall also be required to arrange for an external audit and inspection programme for evaluating other airport users, including fixed-base operators, ground handling agencies and other organisations working at the aerodrome. Alternately, the internal audit results of these agencies may be acceptable if the results meet or exceed the minimum requirements and do not conflict with the aerodrome's own safety policies.
- (c) The licenced aerodrome must have a programme of carrying out specific inspections following an accident/incident at the aerodrome as well as after any construction/maintenance activity which will have a bearing on the operational safety of aircraft at the aerodrome.

### 3.3.2 Continued Surveillance and Oversight by the CAA-B

3.3.2.1 Periodic audits and inspections by Aerodrome Inspectors of the CAA-B will be necessary to ensure that the Aerodrome Operator meets their obligations under the terms of the Aerodrome Licence and that the aerodrome continues to maintain the level of safety as at the time of initial licensing. The CAA-B will liaise with Aerodrome Operators in advance of audits and inspections to allow for preplanning and to ensure the availability of key personnel, but will also conduct “no notice” unplanned visits. CAA-B Inspectors will be granted unrestricted access to the Aerodrome in order for them to conduct their delegated tasks.

3.3.2.2 To this end, the CAA-B authorised persons may inspect and carry out tests on the aerodrome facilities, services and equipment, inspect the Aerodrome Operator’s documents and records and verify the Aerodrome Operator’s Safety Management System before the Aerodrome Licence is renewed and, subsequently, at any other time, for the purpose of ensuring safety at the aerodrome. Any deviation from the agreed Aerodrome Manual will be brought to the attention of the Aerodrome Operator for developing an action plan to resolve the situation that would have a bearing on the aerodrome’s operational safety.

Such periodic inspections will be organised as follows:

- (a) Pre-inspection briefing with aerodrome management, including coordination with Air Navigation Service Provider personnel.
- (b) Administrative inspection of the Aerodrome Safety Management System.
- (c) Movement area inspections including the inspection and checking of water runways and taxiways, markings, lighting, signs; checking for potentially hazardous conditions if construction work is in progress; checking ground vehicle operations in the movement area; checking for wildlife hazards and wildlife attractants; and checking landing direction indicators and wind direction indicators.
- (d) Rescue and fire-fighting services, their training records; category requirements; response time tests; vessels and equipment checks, personal and respiratory protective equipment.
- (e) Fuel facilities including spot checking, fuel sampling, for compliance with the applicable requirements.
- (f) Post inspection briefing with the aerodrome management, including the determination of appropriate enforcement action for non-compliance with the regulations.

### 3.3.3 Additional Inspector Functions

Other safety functions which may require to be addressed by the Aerodrome Inspector are:

- (a) A first-hand evaluation of full-scale airport emergency exercises to identify problems and deficiencies;
- (b) the provision of guidance at the design and construction stages of aerodrome projects, particularly complex projects or where there is significant work that may impact compliance with the regulations;

- (c) final inspection of completed projects involving complex or significant work to identify problems or deficiencies that need to be corrected in order to comply with the requirements of the regulations;
- (d) the organisation of, and participation in, aerodrome safety seminars and other training programmes to promote a safety culture.

## **AC 3.4 COMPLIANCE AND ENFORCEMENT**

### **3.4.1 General**

Aviation safety at aerodromes depends primarily on adherence to these requirements by Aerodrome Operators. Promoting compliance with the regulations through education, training and counselling is therefore of primary importance, and only when these efforts have failed would formal enforcement action be taken. Administrative action in the form of a warning letter or correction letter may be considered appropriate when legal action is deemed unnecessary.

Administrative enforcement action is intended to bring the violation to the attention of the Aerodrome Operator, to document corrective action and to require future compliance. Such actions are warranted when the violation does not result in a significant unsafe condition, is not caused by incompetence or lack of required qualifications on the part of the Aerodrome Operator, is not deliberately caused, the attitude of the operator is constructive and positive towards compliance with the regulations and there is no history of such a violation by the operator.

Formal legal enforcement action may be warranted to prevent future violations of the regulations.

Such action may include the issuance of cease-and-desist orders and injunctions and the imposition of sanctions after the act to deter violations. Such sanctions may include revocation, suspension or variation of the Aerodrome Licence.

### **3.4.2 Suspension or Variation of an Aerodrome Licence**

Suspension or Variation of an Aerodrome Licence may be considered if:

- (a) the Aerodrome Operator's Safety Management System is found to be inadequate;
- (b) it is in the interest of operational safety;
- (c) all other means for timely correction of the unsafe condition or ensuring safe aircraft operations have not yielded the required results;
- (d) the technical proficiency or qualifications of the Aerodrome Operator to perform the duties to meet the critical safety requirements in accordance with the regulations are found inadequate;
- (e) the Aerodrome Operator resists or is unwilling to take action to correct or mitigate the condition affecting aviation safety; or



- (f) the Aerodrome Operator wilfully fails to perform an already agreed upon corrective action and suspension of the Aerodrome Licence is the last resort to avoid unsafe operations in the aerodrome movement area.

### **3.4.3 Revocation of an Aerodrome Licence**

Revocation of an Aerodrome Licence may be warranted if the Aerodrome Operator;

- (a) is incapable or unwilling to carry out corrective action or has committed/repeated serious violations;
- (b) has demonstrated a lack of responsibility, such as deliberate and flagrant acts of non-compliance or falsification of records jeopardizing aviation safety; or
- (c) has made it convincingly clear that the continued operation of the aerodrome will be detrimental to the public interest.



## CHAPTER 4

## PHYSICAL CHARACTERISTICS

**AC 4.0 WATER RUNWAY****AC 4.1 Number and orientation of water runways**

AC 4.1.1 The number of water runways at a water aerodrome and their orientation should be such that, for a large percentage of time as practicable but for not less than 95 percent there is at least one water runway for which the surface wind velocity component at right angles to its longitudinal axis will not preclude the landing or taking off of seaplane that the water aerodrome is intended to serve.

**AC 4.2.0 Length of water runways**

AC 4.2.1 The length of the water runway to be provided should be adequate to meet the operational requirements of the critical seaplane for which the runway is intended and should be not less than the longest length determined by applying the corrections for local conditions to the operations and performance characteristics of the relevant seaplanes.

**AC 4.3 Width of Water Runways**

4.3.1 The width of the water runway should be not less than 60 m wherever practicable.

**Water Depth**

4.3.2 The depth of the water measured at low water level in the water runway should not be less than 1.8 m (6 ft.) or less than 0.3 m below the hull or floats when the seaplane is stationary and loaded to maximum takeoff weight.

**Water runway strip**

4.3.3 A protective buffer should extend on each side from the edge of the water runway to a distance of not less than 30 m (100 ft.) and on each end of the water runway to a distance of 60 m wherever practicable.

**AC 4.4 TURNING BASINS**

4.4.1 Turning basins should be provided at the end of the water runway, whenever necessary.

4.4.2 When turning basins are provided it shall have:

- (a) A diameter measured at low water level of not less than twice the specified minimum width of the corresponding water runway;
- (b) The depth of turning basins measured at low water level should be at least that of the corresponding water runway; and



- (c) A horizontal obstruction clearance between the edge of the turning basin and the nearest obstacle of no less than 15 m (50 ft.).

#### **AC 4.5 TAXI CHANNELS**

- 4.5.1 Taxi channels should be provided to permit the safe and expeditious handling of aerodrome traffic. Where provided, the taxi channels shall have a width of not less than 45 m (150 ft.), wherever practicable
- 4.5.2 Wingtip to wingtip clearance for passing seaplanes (dual directional taxi channels) should be not less than 15 m (50 ft.).
- 4.5.3 The depth of the water measured at low water level in the taxi channel should not be less than 1.8 m (6 ft.) or less than 0.3 m below the hull or floats when the seaplane is stationary and loaded to maximum take-off weight.

#### **AC 4.6 MOORING AREAS**

- 4.6.1 Mooring areas should be provided, whenever necessary, for the mooring of seaplane and to permit the embarkation and disembarkation of passengers, loading and unloading of cargo and mail without interfering with the aerodrome traffic.
- 4.6.2 When mooring areas are provided:
  - (a) The size of the mooring areas should be adequate to permit expeditious handling of the peak hour traffic.
  - (b) The depth of water at the mooring area measured at low water level should be at least that of the corresponding taxi channel.
  - (c) The mooring area shall be designed in such a manner as to provide a minimum clearance of 15 m (50 ft.) between any part of the seaplane and any object it could come into contact with depending on water level.

#### **AC 4.7 SHORE FACILITIES**

- 4.7.1 A platform (fixed or floating), ramp or beach should be provided to permit the embarking and disembarking of passengers and crew, loading and unloading of cargo and refuelling.
- 4.7.2 Where a platform is provided it shall:
  - (a) be in a condition that permits constant use without causing injury to persons or
  - (b) damage to aircraft;
  - (c) be attached or anchored in a manner that prevents it from shifting position or becoming detached;
  - (d) have access from the shore that provides for the safe movement of crew and passengers; and
  - (e) have at least two bull rails or provision for appropriate number of tie-down cleats at each seaplane parking position to secure the seaplane.



4.7.3 When a seaplane is normally secured in a position where any seaplane component overhangs the platform and constitutes a hazard to the movement of crew and passengers, the hazard shall be clearly indicated by means of:

- (a) cones; and/ or
- (b) hashed red and white markings; and
- (c) in a manner easily identifiable to crew and passengers.

4.7.4 Where a ramp or beach is provided it shall be:

- (a) built 1.5 times the width of floats or landing gear of the largest seaplane intended to use the facility;
- (b) located in such a manner as to provide a minimum clearance of 1.8 m (6 ft.) between a seaplane wing and any object it could come into contact with; and
- (c) constructed with a slope not steeper than 8:1.



## AC 5.0 CHAPTER 5 OBSTACLE RESTRICTION AND REMOVAL

*Note.— This Part establishes a series of Obstacle Limitation Surfaces (OLS) that define the limits to which objects may project into the airspace in order to minimize the dangers presented by obstacles, either during take-off or approach of seaplanes at water aerodromes.*

### AC 5.1 OBSTACLE LIMITATION SURFACES

**AC 5.1.1** The following OLS shall be established for non-instrument water aerodromes as shown in

Figure 1 provided in Appendix 1:

- (a) a take-off climb/approach surface;
- (b) a transitional surface; and
- (c) an inner horizontal surface.

#### AC 5.1.2 Take-off climb /approach Surface

**Description – The take-off climb/approach surface shall be either straight or curved and established at the end/beginning of the water runway strip.**

**Characteristics – The limit of the take-off climb /approach surface shall be:**

- (a) The width of the inner edge shall not be less than that of the associated water runway strip
- (b) The inner edge shall start at 60 m from threshold of water runway;
- (c) The elevation of the inner edge shall be the elevation of the water aerodrome;
- (d) The length of the take-off climb /approach surface shall not be less than 2500 m (8200 ft.) from the inner edge;
- (e) The slope of the take-off climb/approach surface shall be a minimum of 4 % (1:25);
- (f) The centre line of the take-off climb/approach surface shall define the approach path and be:
  - (i) a straight line; or
  - (ii) an arc of constant radius; or
  - (iii) a combination of a straight line and an arc of constant radius.

#### AC 5.1.3 Straight-in take-off climb/Approach Surface

**AC 5.1.4** Where the slope is designed for a straight-in approach the divergence of the take-off climb/approach surface shall be set at 10% starting from the inner edge.

#### AC 5.1.5 Curved take-off climb/approach Surfaces

Where established, a curved take-off climb/approach surface shall not contain more than one curved portion.





Curved portion of a take-off climb/approach surface shall not allow a change of direction greater than 90 degrees. Where a curved portion of take-off climb/approach surface is provided:

- (a) the straight portion originating at the inner edge shall not be less than 1300 m (4265 ft.); and
- (b) the radius of arc defining the centre line of the take-off climb/approach surface shall not in any portion of the take-off climb/approach surface be less than 736 m (2415 ft.) in accordance with **Figure 2** given in **Appendix 1**.

A take-off climb/approach surface incorporating a curved portion shall be established only where guidance, such as, geographical points or other visual references are available.

*Note.— A curved approach is normally established at a non-instrument water runway where it is necessary to avoid obstacles, terrain, noise sensitive areas, or to utilise the airspace above public lands (e.g. freeways, rivers, golf courses).*

**Table 1 - Dimensions and slopes of obstacle limitation surfaces - water aerodromes**

<b>Approach type – Non-instrument</b>	
<b>Take-off climb/approach surface</b>	
Width of inner edge	Width of water runway strip - (120 m minimum)
Location of inner edge	60 m from the threshold
Divergence take-off climb/approach surface	10 %
Length (minimum)	2500 m
Slope of take-off climb/approach surface (maximum)	4% (1:25)
<b>Transitional Surface:</b>	
Slope (maximum)	Vertical to 15 m then 1:5 (20 %)
<b>Inner Horizontal Surface:</b>	
Height	45 m
Radius	2,500 m



**AC 5.2 OBJECTS AND OBSTACLES**

**AC 5.2.1** No fixed object shall be permitted on a water runway or on a water runway strip.

**AC 5.2.2** Fixed objects or structures that are located within the water aerodrome boundary shall not penetrate OLS unless:

- (a) those structures are for air navigation purposes; or
- (b) are essential to the safety of aircraft operation;
- (c) are marked, in accordance with ICAO Annex 14, Volume I; and
- (d) are frangible.

**AC 5.3.3** A mobile object shall not penetrate take-off climb/approach surfaces, unless procedures are in place to ensure the object is removed during approach and departure operations.

**AC 5.4 OTHER OBJECTS**

**AC 5.4.1** Where an aeronautical study (safety risk assessment) indicates that an object is hazardous to seaplane located on the movement area or in the air in the immediate vicinity of the water aerodrome, it shall be:

- (a) removed; or
- (b) marked; and/or
- (c) lighted in accordance with ICAO Annex 14, Volume I.

**AC 5.4.2** The water aerodrome operator shall conduct a safety risk assessment to establish the required clearances to be used above waterways, lagoons, or harbour.

**AC 6.0 CHAPTER 6 VISUAL AIDS FOR NAVIGATION**

**AC 6.1 Wind direction indicator**

**AC 6.1.1** Unless the direction of the wind can be obtained by radio, at least one wind direction indicator should be installed.

**AC 6.1.2** Where a wind direction indicator is installed it shall be:

- (a) of an international orange, orange and white or red and white colour; and
- (b) in the form of a truncated cone.

**AC 6.1.3** The wind direction indicator should be:

- (a) visible at a height of 300 m (1000 ft.) above the water runway; and



- (b) visible from any portion of the manoeuvring area.

## **AC 6.2 Markings**

### **6.2.1 Dock identification marking**

#### **Characteristics**

##### **6.2.1.1** Dock identification markings shall consist of:

- (a) a triangle;
- (b) painted bull rails

**6.2.1.2** Both markings shall be affixed to the upper surface of the dock so as to be visible from 300 m (1000 ft.) above the water runway.

#### **Bull rails**

**6.2.1.3** Where bull rails are installed they shall be painted in alternated bands of international orange and white stripes.

#### **Gangways**

**AC 6.2.1.4** Gangways shall be painted red or signage provided indicating seaplane access only.

### **AC 6.2.2 Marker buoys**

#### **Characteristics**

**AC 6.2.2.1** Marker buoys shall be visible to aircraft:

- (a) manoeuvring on the surface of water; and
- (b) 300 m (1000 ft.) above the water runway.

#### **Water runway markers**

**AC 6.2.2.2** Except as specified in 6.2.2.3 at water aerodromes where there is no conflict with marine traffic or marine regulations:

- (a) Both ends of the take-off and landing area shall be marked with floating markers.
- (b) The markers shall be visible from a distance greater than 2 nautical miles.
- (c) Each marker shall be:
  1. of international orange in colour; or
  2. alternating international orange and white.



**AC 6.2.2.3** Where it is impracticable to mark the water runway as specified

- (a) guidance such as geographical points and/or other visual references shall be provided to designate the take-off and landing area; and
- (b) these visual references shall be identified and published.

**Hazardous areas markers**

**AC 6.2.2.5** Where shoals or other hazards could endanger a seaplane, marker buoys shall be installed to clearly indicate the hazardous area.

**AC 6.2.2.6** Marker buoys for delineating hazardous area shall be distinctly marked from water runway markers in colour and shapes.

**AC 6.3 Signs**

**Prohibited signs**

**AC 6.3.1** A sign shall be provided and displayed on the dock restricting the dock to seaplane operations only.

**AC 6.3.2** A sign shall be displayed on the dock restricting passengers from the docking area until all seaplanes and propellers have come to a complete stop.

**AC 7.0 CHAPTER 7 VISUAL AIDS FOR DENOTING OBSTACLES**

**AC 7.1 Objects to be marked and/or lighted**

**Fixed objects**

**AC 7.1.1** Objects that are conspicuous by their shape, size or colour need not be marked.

**AC 7.1.2** Except as covered under the Marine Act, objects shall be marked in accordance with 6.2.

**AC 7.2 Marking of objects**

**General**

**AC 7.2.1** Except as specified in 6.1.1 all fixed objects shall be marked in a conspicuous colour.

**AC 7.2.2** Where it is not possible to colour the objects, markers or flags shall be displayed on or above the objects.

**Use of colours**

**AC 7.2.3** The colour and form of marking displayed on objects shall be in accordance with *Annex 14, Volume I- Aerodrome Design and Operations*.



**Use of markers**

**AC 7.2.4** Markers displayed on or adjacent to objects shall be:

- (a) located in conspicuous positions so as to retain the general definition of the object; and
- (b) recognizable in clear weather from a distance of:
  - 1000 m for an object to be viewed from the air; and
  - 300 m for an object to be viewed from the ground in all directions in which a seaplane is likely to approach the object.

**AC 7.2.5** The shape of the markers shall be:

- (a) distinctive to the extent necessary to ensure that they are not mistaken for markers employed to convey other information; and
- (b) such that the hazard presented by the object they mark is not increased.

**AC 7.2.6** The colour selected shall contrast with the background against which it will be seen.

**AC 8.0      CHAPTER 8      WILDLIFE STRIKE HAZARD REDUCTION**

*Note.— The presence of wildlife (birds) on and in the water aerodrome vicinity poses a serious threat to seaplane operational safety.*

**AC 8.1** The wildlife strike hazard on or in the vicinity of water aerodrome shall be assessed through an ongoing evaluation of the wildlife hazard by competent personnel.

**AC 8.2** Action shall be taken to decrease the risk to seaplane operations by adopting measures to minimize the likelihood of collisions between wildlife and seaplane.

**AC 9.0      CHAPTER 9      LIGHTING OF MOVEMENT AREA**

**AC 9.1** Floodlights or spotlights should be installed on the shore to illuminate aprons, floats, ramps, and piers wherever necessary. Care must be taken in locating and aiming floodlights to preclude affecting the vision of pilot's landing or taking off or creating distracting reflections.

**AC 10.0      CHAPTER 10      RESCUE AND FIRE FIGHTING**

**Level of protection to be provided**

**AC 10.1** At water aerodromes the rescue and fire-fighting vessel(s) shall be provided appropriate to the level of protection required.



- AC 10.2** The rescue vessel(s) provided shall be appropriate for the environment involved and they shall be capable or shall carry equipment capable of accommodating twice the maximum number of passengers carried by the largest type of seaplane serving the water aerodrome.
- AC 10.3** The level of protection provided at a water aerodrome for rescue and fire-fighting should be appropriate to the water aerodrome using principles in paragraphs 9.2.4 and 9.2.5 of ICAO Annex 14 Volume I.
- AC 10.4** Types of extinguishing agents and the amount of water for foam production and complimentary agents—should be provided on the rescue and fire-fighting vessel(s) in accordance with the aerodrome category for rescue and firefighting determined under Table 9-1 and Table 9-2 of ICAO Annex 14 Volume I.
- AC 10.5** The equipment and information sufficient to navigate to and from the incident site, communicate with survivors and rescue personnel, effect entry and fire-fighting and provide medical assistance should be provided in rescue and fire-fighting vessels.
- AC 10.6** A communication system shall be provided linking the water aerodrome fire station, control tower (if available), fire and rescue vessel(s), fire and rescue vehicles and any other fire station (if available) in the vicinity.
- AC 10.7** An alerting system for rescue and fire-fighting personnel, capable of being operated by that station, shall be provided at a fire station, any other fire station in the vicinity and the aerodrome control tower.

#### **Response time**

- AC 10.8** For water aerodromes the operational objective of the RFFS shall be to achieve a response time not exceeding fifteen (15) minutes to any point of each operational water runway, in optimum visibility and surface conditions.
- AC 11.0** **CHAPTER 11 WATER AERODROME EMERGENCY PLANNING**
- AC 11.1** The operator of water aerodrome shall prepare and submit an Aerodrome Emergency Plan (AEP) for the particular water aerodrome for approval/acceptance by the regulatory authority.
- AC 11.2** The objectives of emergency planning outlined in Chapter 9 of ICAO Annex 14; Volume I apply equally to water aerodromes.
- AC 11.3** The emergency plan shall consider the particular hazards associated with seaplane operations, including:
- (a) passenger evacuation into a further life-threatening environment, e.g. deep water;

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- (b) the onset of hypothermia, and its associated effects, during and following prolonged immersion in cold water; and
- (c) the immediate toxicity and respiratory effects on survivors in the water following the ingestion of floating fuel and oils and their associated vapours, and fire suppressant foams, powders, and gases.

### **AC 11.4 The AEP shall contain provisions for:**

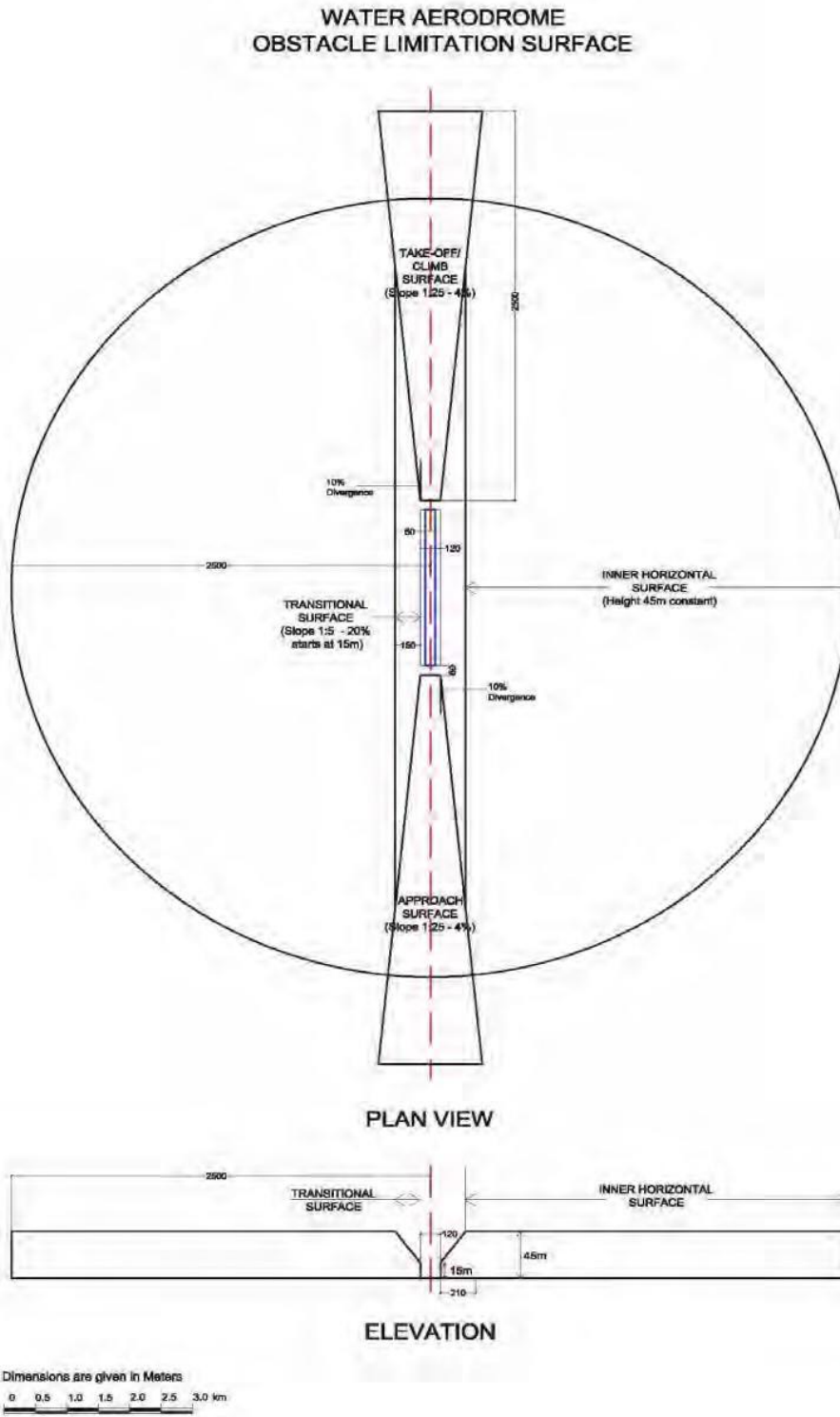
- (a) water rescue;
- (b) fire response; and
- (c) recovery of disabled aircraft from the movement area.

The AEP shall contain procedures for periodic testing of the adequacy of the plan and for reviewing the results in order to improve its effectiveness.

The AEP shall be tested in accordance with the Annex 14, Volume I requirements.

*Note.— Additional guidance on seaplane accidents in the water is outlined in Appendix 6 to the ICAO Airport Services Manual (Doc 9137) Part 7.*

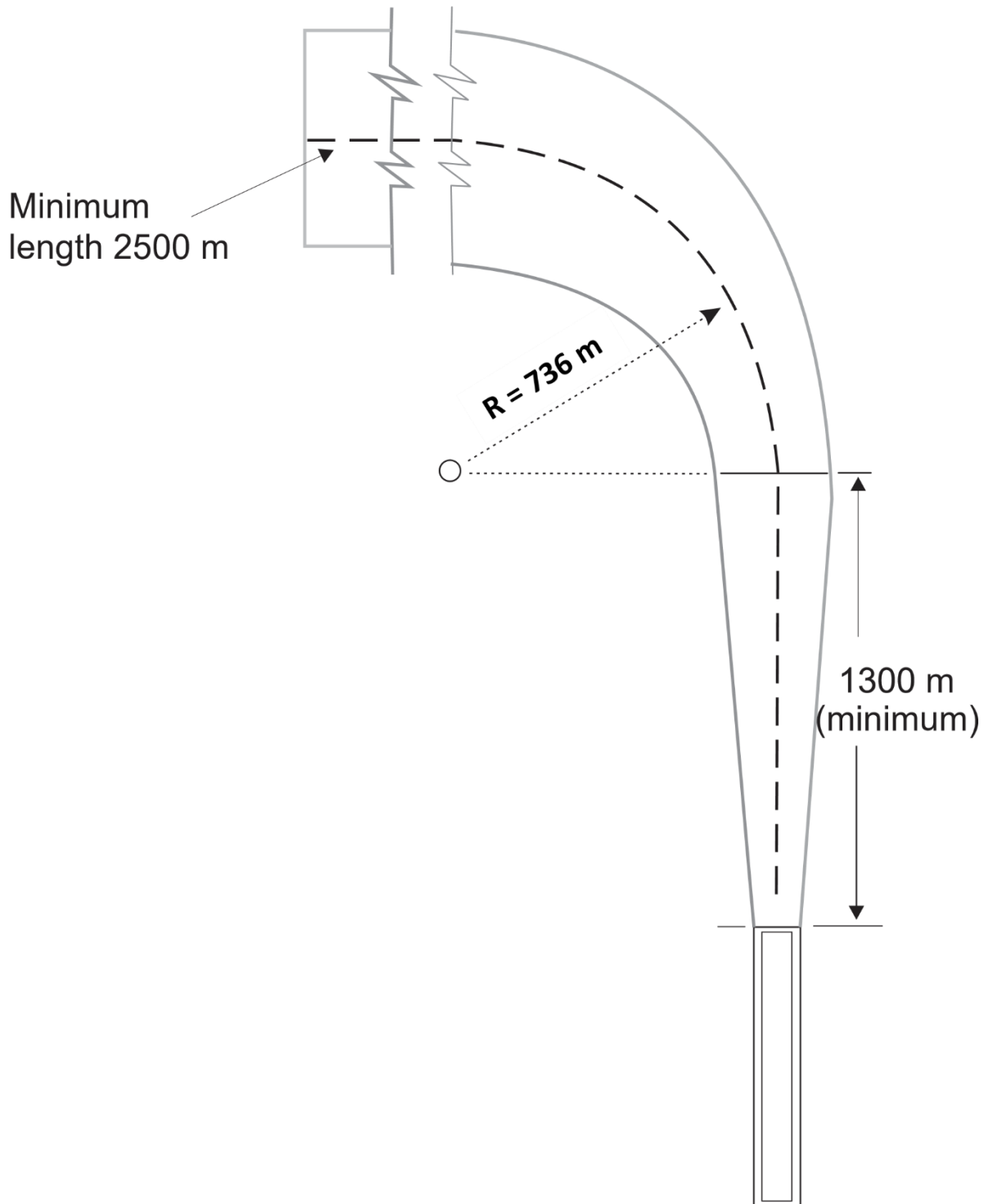
**APPENDIX 1** — Figure 1 – Obstacle Limitation Surface







**APPENDIX 1** — Figure 2 – Curved Take-Off Climb/Approach Surface



**APPENDIX 2****REFERENCES**

- 1) Annex 14 — Aerodromes, Volume I — Aerodrome Design and Operations
  - 2) CAR AGA 4 – Water Aerodromes
  - 3) ICAO Doc 9774 - Manual on Certification of Aerodromes (First Edition 2001)
  - 4) ICAO Doc 9981 – PANS Aerodromes (Second Edition 2016)
  - 5) CAR DEF - Definitions
- Air Safety Support International, Overseas Territories Aviation Requirements, Part 139 – Licencing of Aerodromes, Subpart F – Water aerodromes
  - FAA Advisory Circulars, AC No. 150/5395-1B – Seaplane Bases
  - Supplementary Information Relating to the Report on Requirements for a Safety Case pertaining to Air and Water Operations in Victoria Harbour, Quala Tech Aero Consulting Ltd., 20 September 2010.

—END—